"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AUTHORS: Akopyan, A. N., Saakyan, A. M., Avetyan, M. G. 79-28-5-19/69

TITLE: Synthesis and Investigation of ~~the~~ Chlorination Products of Acetylenyl Divinyl (Hexadiene - 1,3 - yne 5) (Sintez i issledovaniye produktov khlorirovaniya atsetilenildivinila) (geksadiyen-1,3-in-5)

PERIODICAL: Zhurnal Obshchey Khimii, 1958, Vol. 28, Nr 5, pp. 1221 - 1224 (USSR)

ABSTRACT: There are no data in publications on the chlorination of acetenyl divinyl, whereas that of divinyl acetylene was investigated in detail (Reference 5). In the chlorination process of divinyl acetylene its di-, tetra-and hexachlorine derivates form and the formation of each subsequent compound from the preceeding one takes place by addition of chlorine in the position 1,4, i.e. at the endings of the conjugated enine or diene. Possibly the reason for this regularity is the symmetrical structure of divinyl acetylene. Acetylenyl divinyl differs from divinyl acetylenyl by the asymmetrical structure of the molecules, so that a different course of chlorination was to be expected. In the laboratory of the authors a higher chlori-

Card 1/3

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79-28-5-19/69

Synthesis and Investigation of the Chlorination Products of Acetylenyl Divinyl (Hexadiene -1,3 - in 5)

nation velocity of divinylacetylene compared to that of divinyl acetylene was found. The investigation of the chlorination reaction of the latter could prove, besides further syntheses, useful also in technical fields. Different from divinyl acetylene the chlorination process of acetylenyl divinyl proceeds till to saturation, i. e. to the octachlorohexane. According to its structure the octachloride to be expected would have to have the formula 1,1,2,2,3,4,5,6 octachlorohexane= $CHCl_2 - CCl_2 - CHCl - CHCl - CHCl - CH_2Cl$. This way by the chlorination of acetylenyl divinyl the following compounds not described in publications were synthetized: 1,6-dichlorohexatriene - 1,2,4; 1,2,3,6 - tetrachlorohexadiene -1,4; 1,2,3,4,5,6-hexachlorohexene - 1 and 1,1,2,2,3,4,5,6 - octachlorohexane. Di - and tetrachlorine derivatives are extremely unstable liquids with a strange unpleasent smell; they soon split off hydrogen chloride and resinify. Octachlorohexane forms scaly crystals with camphor smell.

Card 2/3

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79-28-5-19/69

Synthesis and Investigation of the Chlorination Products of Acetylenyl Divinyl (Hexadiene -1,3-yne 5)

There are 1 table and 5 references, 3 of which are Soviet.

ASSOCIATION: Khimicheskiy institut AN Armyanskoy SSR (Chemical Institute of the AS Armenian SSR)

SUBMITTED: April 22, 1957

Card 3/3

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

5(3)

AUTHORS: Kolesnikov, G. S., Avetyan, M. G. SOV/62-59-2-23/40

TITLE: Carbon-chain Polymers and Copolymers (Karbotsepnyye polimery i sopolimery). Communication 6. Synthesis and Polymerization of 1,1-Dichloro-2-fluoro Ethylene (Soobshcheniye 6. Sintez i polimerizatsiya 1,1-dikhlor-2-ftoretilena)

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye khimicheskikh nauk, 1959, Nr 2, pp 331-334 (USSR)

ABSTRACT: In the present paper 1,1-dichloro-2-fluoro ethylene was synthesized as follows: 1,1,2-trichloro-2-fluoro ethane was obtained by interaction of 1,1,2,2-tetrachloro ethane with antimony fluoride in the presence of antimony pentachloride at 130 - 140° (Ref 10). The 1,1,2-trichloro-2-fluoro ethane was removed from the reaction medium during its formation. Thus its yield was increased up to 83 - 85% since a further substitution of fluorine for chlorine in the 1,1,2-trichloro-2-fluoro ethane as well as its transformation into 1,1-dichloro-2,2-difluoro ethane could be largely avoided. 1,1-dichloro-2-fluoro ethylene was obtained from 1,1,2-trichloro-2-fluoro ethane by separation of hydrogen chloride with sodium isoamylate. 1,1-dichloro-2-

Card 1/3

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

L 12864-63 EPR/EWP(j)/EPF(c)/EWT(m)/BDS ASD Ps-4/Pc-4/Pr-4
RM/WW

ACCESSION NR: AP3002636

S/0171/63/016/003/0247/0256

74
72

AUTHOR: Avetyan, M. G.; Darbinyan, E. G.; Matsoyan, S. G.

TITLE: Investigations in the area of cyclic polymerization and copolymerization. Part 24. Study of the copolymerization of propenylisopropenylketone and vinylisobutenylketone with acrylonitrile, vinylidene chloride and 2-methyl-5-vinyl pyridine

SOURCE: AN ArmSSR. Izv. Khimicheskiye nauki, v. 16, no. 3, 1963, 247-256

TOPIC TAGS: cyclic polymerization, copolymerization, propenylisopropenylketone, vinylisolutenylketone, acrylonitrile, vinylidene chloride, 2-methyl-5-vinyl pyridine

ABSTRACT: The copolymerization of propenylisopropenylketone (PIK) and vinylisobutenylketone (VIK) with acrylonitrile (AN), vinylidene chloride (KHV) and 2-methyl-5-vinylpyridine (MVP) in the presence of benzoyl peroxide was investigated. The polarity (e) and specific activity (Q) of the monomers was determined, the copolymerization constants y sub 1 and y sub 2 were calculated and found to decrease in magnitude for the following pairs of monomers: VIK - AN greater than PIK - AN greater than VIK - MVP greater than PIK - MVP greater than PIK - KHV greater than VIK - KHV. The variance in the copolymerization of the monomers as affected by

Card 1/2

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

L 12864-63

ACCESSION NR: AP3002636

their polarity and activity is discussed. In the copolymerization of substituted divinylketones with vinyl monomers, cyclization with the formation of cyclopentanone rings in the main chain of the copolymer takes place in addition to vinyl copolymerization: (PIK - KHV 60.5% cyclization; PIK - AN 21.5%). "IR spectra of the copolymers were taken by A. V. Mushegyan on the IKS - 14 instrument in paste and in mineral oil." Orig. art. has: 9 tables, 3 figures, 2 formulas.

ASSOCIATION: Institut organicheskoy khimii AN ArmSSR (Institute of Organic Chemistry, AN ArmSSR)

SUBMITTED: 04Jan63 DATE ACQ: 12Jul63 ENCL: 00

SUB CODE: 00 NO REF SOV: 004 OTHER: 001

Card 2/2

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVETYAN, M.G.; DARBINYAN, E.G.; SAAKYAN, Al'b.A.; KINOYAN, F.S.; MATSOYAN, S.G.

Cyclic polymerization and copolymerization. Part 17: Radical polymerization of substituted divinge ketones. Vysokom. soed. 6 no.1:3-9 Ja'64. (MIRA 17:5)

1. Institut organicheskoy khimii AN Armyanskoy SSR.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

L 22587-65 EWT(m)/EPF(c)/EWP(j)/T Pc-4/Pr-4 RM

ACCESSION NR: AP5004996 S/0171/64/017/004/0412/0419

AUTHOR: Matsoyan, S. G.; Avetyan, M. G.; Darbinyan, E. G.

TITLE: Investigations in cyclic polymerization and copolymerization. XXXI. Study of radical polymerization of Beta-alkyl-substituted divinylketones

SOURCE: AN ArmSSR. Izvestiya. Khimicheskiye nauki, v. 17, no. 4, 1964, 412-419

TOPIC TAGS: polymerization, ketone

Abstract: Polymerization of β-methyldivinylketone, β-n-propyldivinylketone, β, β-methylethyldivinylketone, β, β-diethyldivinylketone, β, β-pentamethylenedivinylketone, and β, β-methylterbutyldivinylketone in bulk and in solutions containing benzoyl peroxide and azoisobutyric acid dinitrile was studied. It was found that the total polymerization rate of substituted divinylketones is proportional to the monomer concentration to the first power and the square root of the initiator concentration. The activation energies of polymerization of β, β-methylethyldivinylketone and β, β-pentamethylenedivinylketone are 25.26 and 28.34 kcal/mole, respectively. Polymerization of substituted divinylketones proceeds by cyclization of two monomer molecules and, depending on the nature of the alkyl substituent, leads to the formation of five- or six-membered rings in the main polymer chain. Orig. art. has 2 formulas, 5 graphs, and 2 tables.

Card 1/3

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

L 22587-65

ACCESSION NR: AP5004996

ASSOCIATION: Institut organicheskoy khimii AN ArmSSR (Institute of Organic Chemistry, AN ArmSSR)

SUBMITTED: 03Sep63 ENCL: 00 SUB CODE: OC, GC

NO REF SOV: 007 OTHER: 001 JPRS

Card 2/2

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AKOPYAN, I.A.; AVETYAN, M.G.; MATSOYAN, S.G.

Synthesis of glycidyl ethers of vinyl ethynyl carbinols. Izv. AN Arm. SSR.Khim.nauki 17 no.6:703-705 '64.

1. Institut organicheskoy khimii AN Armyanskoy SSR. (MIRA 18:6)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVETYAN, M.G.; NIKOGOSYAN, L.L.; MATSOYAN, S.G.

Addition of dichlorocarbene to substituted divinylacetylene hydrocarbons. Izv.AN Arm.SSR. Khim.nauki 18 no.4:427-428 '65. (MIRA 18:12)

1. Institut organicheskoy khimii AN Armyanskoy SSR. Submitted April 28, 1965.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AKOPYAN, S.A.; BALASANYAN, M.I.; ANTONYAN, K.A.; PAPOYAN, S.A.; AVETYAN, ~~S.G.;~~ GASPARYAN, E.A.; PKHRIKYAN, Zh.A.; AMUTYUNYAN, T.G.

Immunobiological changes during septicopyemic processes in animals afflicted with radiation sickness. Izv. AN Arm. SSR. Biol. nauki 13 no.8:45-59 Ag '60. (MIRA 13:9)

1. Kafedra fiziologii cheloveka i zhivotnykh Yerevanskogo gosudarstvennogo universiteta, Nauchno-issledovatel'skiy institut perelivaniya krovi Ministerstva zdravookhraneniya Armyanskoy SSR i Nauchno-issledovatel'skiy institut rentgenologii i onkologii Akademii nauk Armyanskoy SSR.

(RADIATION SICKNESS) (SEPTICEMIA)
(LEUCOCYTES)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVETYAN, S.G.

Studying the red blood in normal and anemized rabbits in the mountain climate of Ankavan. Nauch.trudy Erev.un. 64:13-17 '58. (MIRA 11:12)

1. Kafedra fiziologii cheloveka i zhivotnykh Yerevanskogo gosudarstvennogo universiteta.
(MISKHANA--CLIMATE) (ERYTHROCYTES)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVETYAN, Ye.M.

Effectiveness of cotton crop rotations in the Armenian S.S.R. Izv. AN Arm.SSR.Biol. i sel'khoz.nauki 9 no.11:115-120 N '56.

(MIRA 10:1)

1. Institut zemledeliya Ministerstva sel'skogo khozyaystva Armyanskoy SSR.

(Armenia--Cotton growing) (Rotation of crops)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVETYAN, YE. M. Doc Cand Agr Sci -- (diss) " Study of ~~the~~ crop-rotations under ~~in~~ conditions of the cotton regions of the Ar SSR."
Yerevan, 1957. 16 pp 22 cm. (Min of Higher Education USSR. Armenian Agr Inst), 150 copies
(KL, 21-57, 104)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVEZKLYCHEV, A.

Automotive transportation in the Turkmen S.S.R. during the last 40 years. Avt. transp. 42 no.10:8-9 O '64.

(MIRA 17:11)

1. Ministr avtotransporta i shosseynykh dorog Turkmenskoy SSR.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVEZKLYCHEV, A.D.

Work of highway constructors in the development of the national economy of Turkmenistan. Avt. dor. no.10:15-17 O '64. (MIRA 17:12)

1. Ministr avtotransporta i shosseynykh dorog Turkmenskoy SSR.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

GAPUROV, M.; SOPIYEV, I.; KARAYEVA, G.; AVEZMURADOV, N.; KLYCHMURADOV, K.; KHA[illegible], P.; [illegible]KAROV, [illegible].

In the land of sands and creation. Vozn. znan. [illegible] F '65.

1. Predsedatel' Soveta Ministrov Turkmenskoy SSR (for Gapurov). 2. Predsedatel' sel'skokhozyaystvennoy arteli "Sovet Turkmenistana" (for Sopiyev). 3. Predsedatel' Leninskogo ispolnitel'nogo komiteta rayonnogo Soveta deputatov trudyashchikhsya Ashkhabada (for Karayeva). 4. Nachal'nik Ashkhabadskoy shkoly grazhdanskoy oborony Vsesoyuznogo obshchestva sodeystviya armii, aviatsii i flotu SSSR (for Avezmuradov). 5. Nachal'nik Ashkhabadskikh kursov grazhdanskoy oborony (for Klychmuradov). 6. Komandir [illegible]. Predsedatel' kolkhoza "[illegible]", Turkmenskaya SSR (for [illegible]ylyyev). 7. Boyets [illegible]nogo otr[illegible] oborony [illegible] Turkmenskaya [illegible] (for [illegible]adov).

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

TEODOROVICH, I.L.; AVSEOV, I.; GUTNIKOVA, R.I.; VOLYANSKAYA, Ye.

Possibility of preventing the coprecipitation of cobalt (II) and iron (III). Zhur. VKHO 10 no.2:238-239 '65.

(MIRA 18:6)

1. Institut khimii AN Uzbekskoy SSR.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

S/229/63/000/003/002/003
E194/E455

AUTHORS: Zinchenko, V.I., Candidate of Technical Sciences, Yel'nik, A.G., Avferonok, E.I., Engineers

TITLE: Noise studies in a hydrofoil ship

PERIODICAL: Sudostroyeniye, no.3, 1963, 29-34

TEXT: Noise studies were made on the prototype hydrofoil ship "Strela-1" in order to locate the main sources of noise, its method of transmission and possible means of reducing noise and vibration. The noise absorption properties of the construction were investigated. Noise levels were measured and found to be unacceptably high in both passenger accommodation and engine room; the noise level was little affected by roughness of the sea. The main sources of noise in the passenger accommodation were the screw and the hydrofoils; engine noises were reasonably well damped. Data are given on hull vibration and on vibration in the engine room. It is concluded that, in general, sound insulation of the machinery has been very effective, particularly that of ducting and pipework associated with the diesel engine. Unfortunately very little attention has been paid to noise from the hydrofoils and

Card 1/2

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

Noise studies in a hydrofoil ship S/229/63/000/003/002/003
E194/E455

screw, so that noise levels may be as high as 109 db in passenger and crew accommodation. This is not only uncomfortable but dangerous because syrens of other vessels may remain unheard. It will be difficult to reduce the noise level in hydrofoil craft which combine such serious sources of noise and vibration as hydrofoils and screw with a light hull construction but it must be done, even if it adds weight to the vessels. Methods of reducing noise and vibrations that might be tried include "floating" construction of cabins and other accomodation; use of vibration damping material in the hull, particularly in those parts where vibration is severe; vibration insulation of thrust bearings and other parts of the drive; use of optimum clearances between screws and hydrofoils so as to minimize the influence of the screw on the hydrofoil; use of flexible mountings for diesel engines; improved vibration insulation of engine exhaust piping. There are 6 figures.

Card 2/2

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVGEVICH, V.

Pobeda Aeroflota v Arktike. [The victory of the Civil Air Fleet Administration in the Artic]. (Grazhdanskaia aviatsiia, 1933, no. 1, p. 5).

DLC: TL504.G7

SO: Soviet Transportation and Communications, A Bibliography, Library of Congress, Reference Department, Washington, 1952, Unclassified.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVGEVICH, V. I., Engr. Cand. Tech. Sci.

Dissertation: "Aerial Photography of Polar Ices." Moscow Inst of Engineers of Geodesy, Aerial Photography and Cartography, 25/4/47.

SO: Vechernyaya Moskva, Apr, 1947 (Project #17836)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVGEVICH, V. I.

Working Out of a Single Route of a Planned Reconnaissance Aerial Photographic Survey Without Special Ground Substantiation

Experimental operations have shown that in the development of single routes the best results are attained by computation of the path speed from the data included in the aerial photographs themselves, and not from the time of flight between two orientations. On the basis of this computation the author proposes that under conditions of steady horizontal flight the altitude of photographing (for aircraft of the heavy type) not deviate from a given value b more than ± 20 meters; therefore the mean error of altitude will not exceed ± 5.5 meters. Then for H = 500 meters the relative error in the altitude will not be much longer than 1%. (RZhGeol, No. 4, 1955) Tr. Mosk. in-ta inzh. geodezii, aerofotos'yemki i kartografii, No. 16, 1953, 51-57.

SO: Sum. No. 744, 8 Dec 55 - Supplementary Survey of Soviet Scientific Abstracts (17)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVGEVICH, V. I.

"Photogeodetic Works in Rapid Measurements of Depths by an Echometer". Tr. Mosk. in-ta, inzh. geod., aeros'yemki i kartogr., No. 19, pp 33-54, 1954.

New procedures in using photogrammetric resections are suggested by means of an automatic camera and rapid coordination of measurements and coordinate determination. Special graphical methods were devised. This method was found to be 35% more efficient than previous ones. Wide-angle cameras, their setting, and other equipment are described. (RZhAstr, No. 1, 1956)

SO: Sum No 884, 9 Apr 1956

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVGEVICH, V. I.

AVGEVICH, V. I. --"New Trends in the Use of Aerial Photography and Photogrammetry in the Hydrological Investigation of the Ice Conditions of Seas and Rivers." Acad Sci USSR, Inst of Geography, Moscow, 1956 (Dissertation for the degree of Doctor of Geographic Sciences.)

KNIZHNAY LETOPIS
No 41, October 1956

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVGEVICH, V.I., dotsent, kand.tekhn.nauk

New variants of the use of slot cameras in aerial photographic surveying. Trudy MIIGAIK no.22:47-52 '56.
(MIRA 13:4)

1. Kafedra prikladnoy geodezii Moskovskogo instituta inzhenerov geodezii, aerofotos"yemki i kartografii.
(Photography, Aerial)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVDEYEVICH, V.I., dotsent, kandidat tekhnicheskikh nauk.

Apparatus for photogrammetric interpolation in high-speed depth measurements. Trudy MIIGAIK no.24:83-94 '57. (MIRA 10:8)

1. Kafedra prikladnoy geodezii.
(Aerial photogrammetry) (Surveying--Instruments)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVGEVICH, V.I., dotsent, kandidat tekhnicheskikh nauk.

Photographic protractor. Trudy MIIGAIK no.25:11-21 '57.
(MLRA 10:8)

1.Moskovskiy institut inzhenerov geodezii, aerofotosyemki i kartografii, Kafedra prikladnoy geodezii.
(Photography--Apparatus and supplies)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVGEVICH, Vitol'd Ivanovich (Mos Inst of Geodetic, Aerophoto-Survey, and Cartographic Engrs) awarded sci degree of Doc Geographic Sci for 11 Dec 56 defense of dissertation: "New Approaches in the Use of Aerophoto-Surveying and Photogrammetry in Hydrological Researches in Ice-bound Rivers and Seas" at the Council, Inst of Geography, AS, USSR; Prot No 2, 18 Jan 58.

(BMVO, 6-58, 12)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AUTHOR: ~~Avgevich, V. I.,~~ Doctor of Geography, Senior Research Assistant SOV/154-58-5-12/18

TITLE: On Problems Concerning the Methods of Increasing Accuracy in Aerial Surveying for Mapping of Ice Distribution on the Ocean (K voprosu o metodakh povysheniya tochnosti vozdushnoy s"yemki pri kartografirovanii ledovoy obstanovki na moryakh)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Geodeziya i aerofotos"yemka, 1958, Nr 5, pp 131 - 138 (USSR)

ABSTRACT: Air planes have been widely used in the investigation of the ice cover of freezing sea areas belonging to the USSR. Air reconnaissance greatly facilitates the compilation of maps portraying the ice distribution on sea areas belonging to the USSR. Nevertheless the practical experience collected demonstrates that in some respects this method of observation is still imperfect. The continually growing extension of the ice-covered areas which have been covered or which should be covered by surveys and the growing prevalence of this cartographic method will lead in connection with aerial photography to an improvement

Card 1/4

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

On Problems Concerning the Methods of Increasing Accuracy in Aerial Surveying for Mapping of Ice Distribution on the Ocean SOV/154-58-5-12/18

of map material on ice distribution. An increase of the quality of aerial surveys can, on the one hand, be achieved by the method of the so-called "semi-instrumental survey" (poluinstrumental'naya s"yemka). An even greater accuracy of estimating and characterizing the ice distribution can be achieved by comparing the picture observed from the airplane with the standard aerial photographs by means of a deciphering key. In order to speed up the photographic process a magnetophone is used instead of the procedure of entering the data into the concerning book. The most simple method of measuring the distance to objects of the flight path consists of using a line system engraved into the panels of the airplane cockpit. This suggestion is due to V. N. Andreyev. More reliable measurements which only partly necessitate the use of instruments can be obtained with the perspective scale instrument. This is a frame view-finder with a raster made of caprone threads, the mutual position of which within the frame can be adjusted by means of a special adjustment mechanism.

Card 2/4

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

On Problems Concerning the Methods of Increasing Accuracy in Aerial Surveying for Mapping of Ice Distribution on the Ocean SOV/154-58-5-12/18

The author considers the modernized variant of the airplane collimator range finder NKPB as being especially well suited for this purpose. The application of this range finder permits a definite determination of distances at any relative bearing which occurs in practice. A radical means of improving the precision of surveys is by the author quoted to be that special method of mapping which is realized with the aerographic "planoscope". The principal parts of this instrument are: An interchangeable lens, a conus, a ground glass plate in the focal plane, 2 film spools with a considerable capacity, a pertaining re-winding mechanism and a rheostat. Some pertinent data are presented: Format of image aperture: 24 x 24 cm, format of image field open to observation: 24 x 24 to 18 x 18 cm. width of the strip open to observation from 1.8 H to 1.5 H, capacity of film holders 110 m, winding speed: from 1.5 mm/sec to 15 mm/sec. Duration of uninterrupted strip exposure: from 2 to 20 hours. The instrument is operable at altitudes of 500 to 2000 m, range of photographic scale from 1:5000 to 1:30000. There are 5 figures and 3 Soviet references.

Card 3/4

ASSOCIATION: Institut Geografii Akademii nauk SSSR (Institute of Geography, Academy of Sciences USSR)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

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3(4)

AUTHOR: Avgevich, V. I., Docent, Doctor of Geographical Sciences SOV/154-58-6-8/22

TITLE: The Possibility of Using Elastic Oscillations of the Sound Frequency Range for Speeding up of Development of Airborne Films in the Air Under Photo Laboratory Conditions (O vozmozhnosti ispol'zovaniya uprugikh kolebaniy zvukovogo diapazona chastot dlya uskoreniya fotolaboratornoy obrabotki aeroplenki v vozdukhe)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Geodeziya i aerofotos"yemka, 1958, Nr 6, pp 73 - 83 (USSR)

ABSTRACT: The special character of air reconnaissance in ice regions requires quick reporting. The latter obliges to use high-speed processing of the exposed film during flight. The results of the first test series of such quick procedures with the use of elastic oscillations in the chemical-photographic processing of the aerial camera film are presented here. The tests were carried out at the Moskovskiy institut inzhenerov geodezii, aerofotos"yemki i kartografii (Moscow Institute for Geodesy, Aerial Photography and Cartography Engineers) by order of the Tekhnicheskoye upravleniye Ministerst-

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The Possibility of Using Elastic Oscillations of the Sound Frequency Range for Speeding up of Development of Airborne Films in the Air Under Photo Laboratory Conditions SOV/154-58-6-8/22

va morskogo flota SSSR (Technical Administration of the Ministry of Merchant Marine, USSR). Beside the experts of the MIIGAiK grouped to a working brigade under the direction of the author, V. M. Fridman, Candidate of Technical Sciences, took part in these tests as a scientific advisor for ultrasonics. The possibility of speeding up the chemical-photographic processing of the aerial camera film with the use of elastic oscillations of the sound frequency range was investigated in developing, fixing and rinsing. The first test objects were the sensitograms. The influence of continuous supersonic effect on the chemical composition and on the mechanical properties of the film was also examined. Only the most important results are collected here. It was stated by way of experiment that in using the piezoelectric and the magnetostrictive vibrators the efficiency of supersonic action on the film processing is determined by the interaction of the following three main factors: frequency of oscillations, strength of radiation and propagational direction of elastic oscillations. The tests showed that the speeding up of pro-

Card 2/4

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The Possibility of Using Elastic Oscillations of the Sound Frequency Range for Speeding up of Development of Airborne Films in the Air Under Photo Laboratory Conditions SOV/154-58-6-8/22

cessing by means of ultrasonics is insufficient, and the use of supersonic sources would be connected with great difficulties of organization. Therefore, hydrodynamic and eccentric vibrators were studied. The eccentric vibrators are the source of oscillations with an infrasonic frequency range. Of these two vibrators, the eccentric one proved to be most suitable for practical purposes. The analysis showed that beside the above-mentioned three factors also the amplitude of oscillation plays an important part, and also determines the efficiency in using the elastic oscillations for the film development. The whole vibrator unit with the mechanical eccentric vibrator is described here; elastic oscillations with a frequency up to 200 cycles are obtained with its help. The technical conditions for making experimental types were already worked out in the MIIGAiK. It cannot be said with certainty whether the eccentric vibrator will prove a success in the air-plane. Beyond any doubt is its utility in stationary units of the field air survey

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The Possibility of Using Elastic Oscillations of the Sound Frequency Range for Speeding up of Development of Airborne Films in the Air Under Photo Laboratory Conditions SOV/154-58-6-8/22

departments of the air fleet. There are 3 figures, 1 table and 2 Soviet references.

ASSOCIATION: Moskovskiy institut inzhenerov geodezii, aerofotos"yemki i kartografii (Moscow Institute for Geodesy, Aerial Photography and Cartography Engineers)

SUBMITTED: June 1, 1958

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APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVGEVICH, V.I.

Transactions of the Laboratory (Contd.) of Aeromethods, AS SOV/3815 USSR
V.7, Materials of 7th AU Interdept Conf. Aerial Survey (Dec 56), Moscow, 1959, 331pp.
Perkis, L.I. [Soyuzmorproyekt - All-Union Association for Maritime Services Planning].
Aerial Stereophotographing of Sea Waves from a Single Aircraft 176

Avgevich, V.I. [Moscow Institute of Geodetic, Photogrammetric, and Cartographic Engineering].
Planimetric Tying of Echometric Measurements of Sea Depths to Aerial-Photography Survey Data 178

Yamutsh, D.A. [Laboratory of Aerial-Surveying Methods].
Photometric Method of Determining the Sea Depth in Shoal Areas 184

Eglit, V.I. [Gidroenergoproyekt - All-Union Association for Hydroelectric Developments].
Use of Aerial Photography in Planning Hydroelectric Power Stations 197

Grigor'yev, V.M., and Ye.S. Kudryavova. [Leningradskiy filial Gidroproyekta - Association for Hydraulic Development Planning, Leningrad Branch].
Use of Aerial Photographs in Planning the Layout of a Reservoir for a Large Hydroelectric Power Station 203

Card 8/15

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

FEDOROV, Valentin Ivanovich, dotsent, kand.tekhn.nauk; GORINOV, A.V., prof., retsenzent; AVGEVICH, V.I., doktor geograf.nauk, retsenzent; KISLOV, V.V., red.; ZUBKOVA, M.S., red.izd-va; MAL'KOVA, N.V., tekhn.red.

[Aerial-photographic survey of highways] Aerofotoizyskaniia avtomobil'nykh dorog. Moskva, Nauchno-tekhn.izd-vo M-va avtomobil'nogo transp. i shosseinykh dorog RSFSR, 1959. 224 p.

(MIRA 12:8)

1. Chlen-korrespondent Akademii nauk SSSR (for Gorinov).
(Photography, Aerial) (Roads--Surveying)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVGEVICH, V.I.

Present state of the mapping of Arctic regions. Probl.Sev. no.3:190-198 '59. (MIRA 13:4)

1. Institut geografii AN SSSR.
(Arctic regions--Aerial photogrammetry)

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVGEVICH, V.I.

Photogeodetic horizontal control of echo soundings by the use of aerial photographs. Trudy Lab.aerofot. 7:178-183 '59. (MIRA 13:1)

1. Moskovskiy institut inzhenerov geodezii, aerofotos"yemki i kartografii.
(Aerial photogrammetry) (Sonar) (Submarine topography)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVGEVICH, V.I., starshiy nauchnyy sotrudnik, doktor geograficheskikh nauk

Methods of using aerial photographs in determining the motion speed of surface ice glaciers. Izv. vys. ucheb. zav.; geod. i aerof. no.4:69-78 '60. (MIRA 13:11)

1. Institut geografii Akademii nauk SSSR.
(Glaciers—Surveying)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

S/169/62/000/007/120/149
A228 D507

AUTHOR: Avgevich, V. I.

TITLE: Deciphering the snow cover of sea ice from air photographs and future prospects for the application of aerial photographic surveying in the study of snow

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 7, 1962, 61-62, abstract 7Г367 (V sb. Rol'snozhn. pokrova v prirodn. protsessakh, M., AN SSSR, 1961, 243-257)

TEXT: By deciphering air photographs of the snow cover accumulated on the surface of sea ice it is possible to expose the most complete picture of air currents in the atmosphere's near-ground layer. Another indicative property of the snow cover of sea ice is its ability to characterize to a certain extent the relief of the lower ice surface and some of its genetic features. In this case not only sastrugi but also snow patches, arising when the snow cover melts in spring, serve as indicators. Analysis of factors, causing the formation of differently shaped snow patches, allowed the author to

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

Deciphering the snow ... S/169/62/000/007/120/149
D228/D307

of the vertically intersecting plane. It is still harder to break such ice no matter what direction is chosen for this purpose. A characteristic example of the use of aerial photographic surveying in snow control is its application for observing the formation of surface run-off in the spring period. The author emphasizes that it is possible to decipher from air photographs the water area of intermittent basins and channels, formed in steppe and arid regions in the period of snow melting. A feature of the study of the terrestrial snow cover's dynamics by the aerial photographic survey method is the simplified technology of both the actual snow survey and the subsequent photogrammetric processing of the resulting air photographs. The stereoscopic examination of the air photographs is not considered to be necessary. It is not the custom to tie in the air photographs in the field; existing maps serve as the snow survey's topographic base. The photogrammetric processing merely comes down to the preparation of negative maps and the measurement of areas. The area covered by snow on each day of the survey is thereby estimated in percentages of the total survey area; the air photography's scale does not, therefore, have to be known.

Card 3/4

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVGEVICH, V.I., doktor geograficheskikh nauk

Use of aerial photographs in studying the dynamics of the ice cover of rivers. Izv.vys.ucheb.zav.; geod.i aerof. no.6:67-76 '61. (MIRA 15:3)

1. Institut geografii AN SSSR.
(Ice on rivers, lakes, etc.) (Aerial photogrammetry)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVGEVICH, V.I.

Using aerial photographs for quantitative characteristics of ice run dynamics. Meteor.i gidrol. no.11:53-56 N '61. (MIRA 14:10)
(Ice on rivers, lakes, etc.) (Aerial photogrammetry)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVGEVICH, V.I.

Using photographic surveying in ice studies. Izv.AN SSSR.Ser.geog. no.3:96-100 My-Je '62. (MIRA 15:5)

1. Institut geografii AN SSSR.
(Siberia--Ice on rivers, lakes, etc.--Photographic surveying)

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVGEVICH, V.I.

Studying the microdynamics of natural processes by means of steriophotogrammetry. Izv. AN SSSR. Ser. geog. no.4:86-94 Jl-Ag '63. (MIRA 16:8)

1. Institut geografii AN SSSR.
(Photographic surveying) (Geographical research)

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AVGEVICH, V., doktor geograficheskikh nauk, prof.

In advance of the airplane. Grazhd.av. 20 no.8:22-23 Ag '63.
(MIRA 16:9)
(Arctic regions) (Airports--Design and construction)

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVGEVICH, V.I.

In the Interdepartmental Commission on Aerial Photography. Izv. AN SSSR. Ser. geog. no.3:146 My-Je '63. (MIRA 16:8)
(Photography, Aerial--Congresses)

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVGEVICH, V.I.

Some characteristics of sea ice, interpreted according to aerial photographs. Vop. geog. no.62:155-165 '63.
(MIRA 17:3)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVGEVICH, V.I., prof., doktor tekhn. nauk

Ground stereoscopic photography of natural features according to plan. Izv. vys. ucheb. zav.; geod. i aerof. no.6:95-112 '63 (MIRA 17:7)

1. Institut geografii AN SSSR.

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVGEVICH, V.I.

Aeromethods in polar sea ice studies. Izv. Vses. geog. ob-va 96 no.3:197-205 '64 (MIRA 17:8)

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVGEVICH, V.I. [deceased]

Practice deserving attention. Izv. AN SSSR. Ser. geog. no.4:131-132 Jl-Ag '65. (MIRA 18:8)

1. Institut geografii AN SSSR.

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PROCESSES AND PROPERTIES INDEX

2

Thermodynamic properties of adsorption films on silica gel. A. V. Kiselev, N. N. Mikos, M. A. Romanchuk, and K. D. Shcherbakova (State Univ., Moscow). *J. Phys. Chem.* (U.S.S.R.) 21, 1223-36(1947) (in Russian).—The isotherms of adsorption and desorption of vapors at 14-20° were detd. for a SiO_2 gel and H_2O, MeOH, and n-heptane. The heat of wetting by evacuated SiO_2 gel was 16.7, 16.7, and 8.8 cal./g. for H_2O, MeOH, and heptane, resp. The specific surface area of the gel was 130-330 sq. m./g. according to the Brunauer-Emmett-Teller method and to the theory assuming the adsorbed film to have the usual surface tension at the start of the hysteresis loop. From the hysteresis loop the most frequent radius of the pores was calcd. to be 40-60 A. The relation between the surface pressure and the work of adsorption was derived. The surface pressure was inversely proportional to the area per mol. as long as this area was large; at higher surface contns. the effects are complicated by the nonuniformity of the surface and by the repulsive forces between the adsorbed mols. J. J. Bikerman

Inst. Adsorption, Chem. Phys. Chem., Moscow State U.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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MIKOS, N. N.

USSR/Physics - Adsorption - Adsorbents Sep 48

"Determining the Area of Adsorption Films on Porous Absorbents: I, Assumptions Fundamental to Determination of Specific Area of Adsorbents," A. V. Kiselev, N. N. Mikos, Lab of Sorption Processes, Inst of Phys Chem, Acad Sci USSR, Moscow, Lab of Adsorption, Moscow State U, 15 pp

"Zhur Fiz Khim" Vol XXII, No 9

From the isotherm for adsorption of vapors are calculated the specific area of the adsorbent s, and the area of the adsorption film s'. For adsorbents with large pores the relation is $s' \simeq s$, and for those with fine pores the relation is $s' < s$. Submitted 30 Dec 47.

PA 56/49T90

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVGUL', N. N. Cand Chem Sci

Dissertation: "Heat of Adsorption on Silica Gels of Various Structures." 10/5/50

Moscow Order of Lenin State V imeni M. V. Lomonosov

SO Vecheryaya Moskva
Sum 71

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185T3

USSR/Chemistry - Adsorption 21 Feb 51

"Investigation of the Structure of an Adsorbent by Several Independent Methods," N.N. Avgul', O.M. Dzhigit, N.M. Kamakin, A.V. Kiselev, V. M. Luk'yanovich, I.Ye. Neymark, R. Yu. Sheynfayn, Moscow State U imeni M.V. Lomonosov, Inst Phys Chem, Acad Sci Ukranian SSR, Inst Phys Chem, Acad Sci USSR, Groznyy Sci Res Petroleum Inst

"Dok Ak Nauk SSSR" Vol LXXVI, No 6, pp 855-858

Adsorption isotherms of benzene, heptane, and MeOH were taken on uniform roughly porous silica gel (structural type 2). Found surface of

185T3

USSR/Chemistry - Adsorption (Contd) 21 Feb 51

adsorbed film to be equal to surface of the adsorbent and not to depend on nature of vapor. Detd distribution of vol of pores by structure-adsorption method, method of pressing Hg into the pores, and electronic microscope method. Results obtained by the 3 methods checked.

185T3

AVGUL', N. N.

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

CA

2

Absolute adsorption isotherms of vapors on quartz and on silica gels of different structures. N. N. Avgul, O. M. Dahigit, V. P. Dreving, M. V. Gur'ev, A. V. Kiselev, and O. A. Likhacheva (Moscow State Univ.). *Doklady Akad. Nauk S.S.S.R.* 77, 77-80(1951).—Abs. adsorption isotherms, i.e. adsorption isotherms referred to unit surface area, were calcd. from previously obtained exptl. data for (I) finely ground cryst. quartz, (II) coarse-pore silica gel "E" (*C.A.* 45, 4995f), optimum pore diam. about 300 A., and (III) coarse-pore silica gel "K," prepd. by hydrolysis of $SiCl_4$ (*C.A.* 30, 6265[9]; 39, 3710[8]), optimum pore diam. 90 A. Sp. surface areas were detd., for I, by adsorption of N_2 at −195.7°, s (skeleton surface area) = 5.7 sq. m./g. by the Brunauer, Emmett, Teller method, 6.6 by the Harkins method, mean 6.2 sq. m./g.; for II, by adsorption of C_7H_{16}, C_6H_6, and MeOH vapors at 20°, s' (adsorption film at the beginning of hysteresis) = 320, 330, and 300, mean 320 sq. m./g.; III, by adsorption of N_2 at −195.7°, s = 440 (B.E.T.) and 430 (Harkins); by adsorption of C_7H_{16} at 20°, s' = 390, and by adsorption of H_2O vapor at 18.2°, s' = 410, mean 420 sq. m./g. Referred to unit surface area, adsorption isotherms of MeOH vapor coincide very exactly for I, II, and III, up to the beginning of the hysteresis loop (relative pressure p/p_0 = 0.6). Not only unimol., but also multimol., adsorptions are analogous; on the silica gels, adsorption is followed by capillary condensation which begins at the lower film thickness on the finer III than on the coarser II. The data of Palmer (*C.A.* 32, 3664[9]) on adsorption of C_6H_6 vapor on quartz glass powder fit the same curve if his sp. surface areas, detd. from rates of solc. and evidently too low, are multiplied by a factor of 1.75. Multimol. adsorption results in films no thicker than 2-3 mols. even at p/p_0 = 0.9; this contradicts assertions of allegedly very thick multimol. adsorption layers formed in the adsorption of vapors (Deryagin, *et al.*, *Doklady Akad Nauk S.S.S.R.* 57, 697(1947)). In order to decide whether the constancy of the abs. adsorption, per unit surface area, applies also to highly fine-pore adsorbents, adsorption isotherms of vapors of N_2, MeOH, and C_7H_{16}, were recalcd. for (IV) silica gel "A" (*C.A.* 43, 1028d), heated to 450°, and giving, with N_2 at −195.7°, a B.E.T. sp. surface area s = 380, Harkins 450, mean 420 sq. m./g. With the latter value, the adsorption isotherms of IV coincide with those of I and III for N_2, and with those of I, II, and III, for MeOH, but for C_7H_{16} the curves of IV and III diverge sharply. This indicates that the narrowness of the pores of IV plays no role in the adsorption of the small mols. of N_2 and MeOH, but does have a marked effect with the large mols. of C_7H_{16}. These findings provide a simple method for the detns. of the sp. surface of a silica gel. It is enough to det. the adsorption a of MeOH vapor at one p/p_0 and to multiply it by the corresponding factor, e.g. 145 at p/p_0, if a is expressed in millimole./g.

N. Thon

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

CA

B. A.

Variation of the heat of adsorption of methyl alcohol vapor on quartz and silica gel with the surface coverage. N. N. Avgul, O. M. Dzhigit, A. A. Isirikyan, A. V. Kiselev, and K. D. Shcherbakova (Moscow State Univ.). *Doklady Akad. Nauk S.S.S.R.* 77, 625-8(1951).—Differential heats of adsorption Q_s were detd. in a calorimeter with const. heat exchange, as a function of the amt. adsorbed a (micromole/g.), on ground quartz (I), a uniformly coarse-pore silica gel "K" (II), and a uniformly fine-pore silica gel "A" (III) (cf. *C.A.* 45, 5485g). The plots of Q_s as a function of a have the same appearance for the 3 samples, with Q_s first falling with increasing a, then leveling off, but the 3 plots do not coincide. If, however, Q_s is plotted as a function of a/s (micromole/sq.m.), where s = sp. surface area (known from previous detns.), all 3 samples fall on the same curve. Between a/s = 0.5 and 9.5 micromole/sq.m., it can be represented by $Q_s = Q_0 - C(a/s)$, with Q_0 = 16.2 kcal./mole, $C = 6.6 \times 10^6$ cal.sq.m./mole^2. The coverage a/s = 0.5 corresponds to the area occupied by 1 mol. of MeOH, ω = 18 sq. A., i.e. corresponds to closest packing of mols. of MeOH in a unimol. layer. From a/s = 9.5 up, Q_s becomes practically const., and only 7% in excess of the heat of condensation L of MeOH. After completion of the 2nd layer, at about a/s = 20 micromole/sq.m., Q_s becomes practically identical with L. The area comprised between the curve of Q_s and the horizontal line corresponding to L represents the heat of satn. with vapor of unit surface area of the adsorbent, and is = 180 ergs/sq. cm.; adding to it the surface energy of MeOH, 48 ergs/sq. cm., one gets 180 + 48 = 230 ergs/sq. cm., in agreement with the directly detd. heat of wetting (Kiselev et al., *Zhur. fiz. Khim.* 21, 1233(1947)). The equation of state given previously (*loc. cit.*), $\pi = kT(a/s) + \alpha(a/s)^2$, where π = surface pressure, α = interaction const., corresponds to Williams' isotherm equation $\log[(p/p_s)/a] = B + K\pi$, which fits the present data, as evidenced by the single straight line in the coördinates $\log[(p/p_s)/(a/s)]$, (a/s). The fall of Q_s with a

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USSR/Chemistry - Adsorption 21 Jul 51

"The Structure of Activated Carbons and Their Sorption Effect on Various Gaseous Substances," N. N. Avgul', O. M. Dzhigit, Acad M. M. Dubinin, A. V. Kiselev, Inst of Phys Chem, Acad Sci USSR, and Moscow State U imeni Lomonosov

"Dok Ak Nauk SSSR" Vol LXXIX, No 3, pp 451-455

Detailed study by the vacuum method was made of the adsorbed quantities, the isotherms of sorption and desorption of vapors of benzene, n-pentane, n-butanol, and methanol at 20° C and of water vapor

211T19

at 25° C on 2 activated carbon samples which differed greatly in structure (monodisperse micropores as compared with large pores). The findings are shown in tables and graphs. It is hoped that a more rigid analysis of desorption curves will yield a more exact idea of the pore structure of activated carbon.

AVGUL', N. N.

211T19

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

KISELEV, A. V.; KISELEV, V. F.;
MIKOS-AVGUL', N. N.; MUTTIK, G. G.;
RUNOV, A. D.; SHCHERBAKOVA, K. D.

Calorimeters and Calorimetry

Automatic calorimeter with constant heat exchange for measuring heats of absorption of gases and liquids.
Trudy Inst. fiz. khimii AN SSSR No. 1, 1952.

9. Monthly List of Russian Accessions, Library of Congress, December 1952. UNCLASSIFIED.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

USSR/Chemistry - Adsorption Jul 52

"Peculiarities of Adsorption of Different Vapors on Silica Gel," N. N. Avgul', O. M. Dzhigit, A. V. Kiselev, K. D. Shcherbakova, Moscow State U imeni M. V. Lomonosov; Inst Phys Chem Acad Sci USSR

Zhur Fiz Khim, Vol 26, No 7, pp 977-985

The isotherms of adsorption of n-heptane, methyl alcohol and water vapor on coarsely porous pure silica gel were studied. All these isotherms have a reproducible hysteresis under high vapor pressures and, in the case of the adsorption of vapors

248T9

of polar substances, a nonreproducible hysteresis when the vapor tension is low. The reproducible sorption hysteresis at comparatively high pressures is solely dependent on the capillary condensation of the vapors in the silica gel pores and is independent of the nature of the vapor. The nonreproducible hysteresis at comparatively low pressures, noted in the adsorption of methyl alcohol and water vapors, occurs when there is partial chemosorption. During the adsorption of heptane vapors there is no such hysteresis; because the adsorption is purely physical. The isotherms obtained for primary ad- adsorption correspond in all instances essentially to physical adsorption.

248T9

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVGUL', N. N.

USSR/Chemistry - Adsorption Jul 52

"The Dependence of the Heat of Wetting Silica Gel by Water on the Degree of Filling of Its Surface," A. V. Kiselev, K. G. Krasil'nikov, N. L. Pokrovskiy, N. N. Avgul', O. M. Dzhigit and K. D. Shcherbakova, Moscow State Uniemi M. V. Lomonosov.

Zhur Fiz Khim, Vol 26, No 7, pp 986-997

This work has both theoretical and practical value. The dependence of the heat of wetting of silica gel by water, on the quantity of previously adsorbed water, was measured on a homogeneous, coarsely porous silica gel made from SiCl and having a known specific surface. Results of the measurements established the abs dependence of the heat of wetting by water and the differential heat of adsorption of the water vapor on amount of water adsorbed per unit of surface. The differential heat of adsorption of water vapor decreases in proportion to the increase in the degree of filling of the surface.

Pa 2,3T10

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

PA 234T17

USSR/Chemistry - Adsorption 1 Sep 52

Adsorption of Vapors on Nonporous Activated Carbon, Particularly Carbon Black," N. N. Avgul', O. M. Dzhigit, A. V. Kiselev, Moscow State U imeni M. V. Lomonosov and Inst of Phys Chem, Acad Sci USSR

"Dok Ak Nauk SSSR" Vol 86, No 1, pp 95-98

Adsorption isotherms of water, methyl alc, and benzene on carbon black are constructed for 0 to 1 p/p_s. Each isotherm is characteristically different from the others. The specific characteristics and differences are described. The

234T17

purpose of the investigation was to investigate the adsorptive properties of the carbon surface itself and to eliminate the effect of pores, which is prominent in ordinary gas-mask carbon. Presented by Acad M. M. Dubinin 27 Jun 52.

234T17

AVGUL', N.N.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVGUL, N.N.

Transl. No. & Country		Author
T 4333 U.S.S.R.	Capillary Condensation of Vapours & Structure of the Pores in Active Carbon Dokl.Akad.Nauk, 89(1), 97-99, 1953, U.S.S.R.	N.N. Avgul G.M. Dzhigit A.V. Kiselev

Notes: Translation issued by TPA3/TIB

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

Determination of the adsorption isotherm and the differential heat of adsorption of water on carbon black.

N. N. Avgul, O. M. Dzhigit, A. V. Kiselev, and K. D. Shcherbakova (M. V. Lomonosov State Univ., Moscow).

Doklady Akad. Nauk S.S.S.R. 92, 105-8(1953); cf. *C.A.* 49, 15359*h*.—Carbon black (C 97.9, H 0.7%, O 1.4%) was evacuated to a pressure of 5×10^{-6} mm. at 250°, and the adsorption and desorption isotherms and heats of adsorption were detd. at 19°. The adsorption and desorption isotherms did not coincide and were characterized by two points of inflection at $p/p_s \cong 0.5$, $a \cong 1.1$ millimol./g. and $p/p_s = 0.84$, $a = 1.97$ millimol./g., resp. (p/p_s is the relative pressure, a is the quantity adsorbed per g. of C black). Values of adsorption were also calcd. in terms of $\alpha = a/s$, where $s = 125$ sq. mm./g. The noncoincidence of adsorption and desorption isotherms was attributed to a slow process of swelling. Calorimetric detn. of the differential heat of adsorption Q_a (cf. Kiselev, *et al.*, *C.A.* 43, 6871*d*) gave values of $Q_a = 10.75$ kcal./mol. ($a < 1.97$ millimol./g.) and $Q_a = 10.55$ kcal./mol. ($a > 1.97$ millimol./g.). The latter value is identical with the heat of condensation $L = 10.6$ kcal./mole. The quantity $a = 1.97$ millimol./g. corresponds to a mean area of 10.5 sq. A. for a H_2O mol. in a unimol. layer (the calcd. value is 10.6 sq. A.). The adsorption capacity of C-black samples decreased with increasing ignition temp. during evacuation prior to adsorption expts. The surface interaction of H_2O with C black appears to be due to H-bond formation with oxides or hydroxides contained in the surfaces investigated. I. P.

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVGUL, N.N.

V Isotherm and heat of adsorption of methanol on carbon black. N. N. Avgul, O. M. Dzhigit, A. V. Kuselev, and K. D. Shcherbakova (Dokl. Akad. Nauk, 333R, 1953, 92, 1185—1188).—Isotherm and heat of absorption of MeOH on C black are determined at 19° and pressures up to the saturated v.p. of MeOH. The curves obtained are of complicated character and can be divided into several parts separated by inflexion points and breaks. The explanation of this phenomenon is given in terms of adsorption stages accompanied by abrupt thermal changes. The stages are: adsorption on highly active centres, formation of a "mobile" monolayer, formation of a "compact" monolayer and of a second layer, and formation of the third and further layers with heat of adsorption approaching heat of condensation of MeOH. S. K. Lachowicz.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

L-Capillary condensation of various vapors on a coarse porous silica gel. N. N. Avgul, O. M. Dzhigit, and A. V. Kiselev (M. V. Lomonosov State Univ., Moscow). *Zhur. Fiz. Khim.* 29, [illegible] 1949, [illegible] In a SiO_2 gel the total vol. [illegible] pores was found [illegible] to be 1.63 [illegible] A (from [illegible]). The [illegible] vol. [illegible] varied between [illegible] per at 20° and 1.76 cc./g. for N_2 at [illegible] equal [illegible]. The area [illegible] of the [illegible] from equation [illegible] the differential work of [illegible] integration being [illegible] varied between [illegible]

[illegible] low gas [illegible] diams was [illegible] from the [illegible] equation. The [illegible] thickness of the [illegible] for benzene [illegible]

[illegible]

The [illegible] 1948 [illegible] new [illegible] above [illegible]

B. Fe[illegible]

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVGUL', N.N.

USSR/ Chemistry - Physical chemistry

Card 1/2 Pub. 22 - 24/51

Authors : Avgul', N. N.; Dzhigit, O. M.; Kiselev, A. V.; and Shcherbakova, K. D.

Title : The isotherm and the heat of adsorption of water vapors over carbon

Periodical : Dok. AN SSSR 101/2, 285-288, Mar 11, 1955

Abstract : The isotherm and the heat of water vapor adsorption were investigated for a finely porous sugar carbon activated in a CO_2 stream at 1000°. Results indicate that the monomolecular water adsorption on the oxidized surface is followed by capillary condensation in the pores.

Institution : Acad. of Sc. USSR, Inst. of Phys. Chem. and the M. V. Lomonosov State Univ. Moscow.

Presented by: Academician M. M. Dubinin, October 5, 1954

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

Periodical : Dok. AN SSSR 101/2, 285-288, Mar 11, 1955

Card 2/2 Pub. 22 - 24/51

Abstract : The pore structure of the carbon was found to have a specific effect on the water vapor adsorption. The monomolecular adsorption and the capillary water vapor condensation apparently superimpose on each other because of the small pore dimension of this carbon. Thirteen references: 7 USSR and 6 USA (1927-1954). Graphs.

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVGUL', N.N.; BEREZIN, G.I.; KISELEV, A.V.; LYGINA, I.A.

Thermodynamics, adsorption forces, and the heat of adsorption of benzene vapors on carbon black. Izv.AN SSSR.Otd.khim.nauk no.11:1304-1311 N '56. (MLRA 10:3)

1. Institut fizicheskoy khimii Akademii nauk SSSR.
(Adsorption) (Benzene) (Carbon black)

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AVGUL, N.N.

2

Effects of chemical structure of carbon black surface and of graphitization of carbon black on the determination of isotherms and heats of adsorption of vapors. N. N. Avgul (M. V. Lomonosov State Univ., Moscow). *Vsesoiuznaia Konf. Sovjetskoi Bel. Vodoroshnoi Adsorbtsii Sbornik Trudov Konferentsii Adsorbtsii* 1957, 54-52. Two kinds of C black were used in the expts. Sterosh (I) and 2-33 (II), both calcined in a stream of [illegible] at 1700° and below 1000°, resp. From the [illegible] [illegible] adsorption of I was higher than that of II; in the unitimol region these isotherms become merged. The differential heat of adsorption (ΔH) for I during the filling of the first [illegible] [illegible] sharply decreased, being related to a partial heterogeneity of the surface. [illegible] remained practically [illegible] of the process, when it increased to 14.0 kcal./mole. Change in the adsorption to the final layer was accompanied by a general decline in the ΔH. With II the ΔH decreased with increase in the adsorption during the entire process, this indicated complete heterogeneity in the structure of the surface. Similar measurements for H_2O showed that ΔH on I was 8.9 kcal./mole. In this process even at higher p/p_0 the adsorbed layer was very thin and was in the bimol. gaseous state.

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AYGUL, N. N.

Energy of adsorption forces and the heat of adsorption for simple molecules on graphite. N. N. Aygul and A. V. Kiselev. Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk 1957, 230-3.—The adsorption energies of single atoms (A, Kr) and simple mols. (N_2, NH_3) on graphite were calcd. on the basis of their elec., magnetic, and geometric properties. The calcd. results agree well with exptl. calorimetric results.

J. Rovtar Lusch

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AVGUL, N. N.

Distr: 4E4j/4E2c(j)

Energy of adsorption bond and heat of adsorption of n-alkanes on carbon black. N. N. Avgul, G. I. Berezin, A. V. Kiselev, and I. A. Lygina. *Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1957, 1021-31(1957).—In a calorimeter of const. heat exchange, abs. isotherms of adsorption and differential heat of adsorption of pentane, heptane, and octane vapors on C black were detd. and compared with those obtained previously. The thermodynamic characteristics of adsorption and wetting were also detd. The standard values of total and free energy and entropy and entropy of adsorption [illegible] linear functions of the [illegible] of C atoms in the [illegible]. The heat of wetting is independent of [illegible]. An approx. equation for the isotherm const. of adsorption of these n-alkanes is given. Theoretically calcd. dependence of the energy of adsorption of n-alkanes on carbon black on n, $\Phi = 0.0 + 1.85\,n$ kcal./mole, gives results that agree satisfactorily with those obtained experimentally.

A. Libacky

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

AUTHORS: Avgul', N. N., Isirikyan, A. A., Kiselev, A. V., Lygina, I. A., Poshkus, D. P. 62-11-4/29

TITLE: Adsorption Equilibria and the Energy of Adsorption Powers (Adsorbtsionnyye ravnovesiya i energiya adsorbtsionnykh sil).

PERIODICAL: Izvestiya AN SSSR, Otdel. Khim. Nauk, 1957, Nr 11, pp. 1314-1327 (USSR)

ABSTRACT: Here the theoretical and experimental investigation of the adsorption powers in physical adsorption, mainly of complicated non-polar molecules with adsorbents of an atomic and ionic lattice, is brought. The results of the theoretical computation are compared with the measurings of the differential heats of the adsorption. Here a method for the computation of the adsorption energy of non-polar molecules with regard to three terms in the potential of the dispersion powers with constants, which are computed by means of polarizibility and magnetization-coefficients, was worked out. With it the induction potential by the average polarizibility of the adsorbed substance and the average electrostatic field of the adsorbent was taken into consideration. Furthermore the push-off potential with a

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constant in the exponent, which is computed from the individual constants of the adsorbent, is taken into consideration. Finally all interactions of the given power center of the molecule of the adsorbed substance are added up with all adsorbent-lattice centers. The push-off constant before the exponential function is determined from the condition of the minimum of total energy of all interactions in an equilibrium distance from the adsorbent-surface. It is shown that the computed adsorption energy amounts of inert gases, nitrogen and 13 hydrocarbons of different structure (normal and isomeric alcanes, alcene, aromatical ones) on graphite are similar to the measured adsorption heats on graphited soot. It is shown that the computed adsorption energy amounts of the n-alcanes, of the benzene and toluene on magnesium oxide are also similar to the measured adsorption-heats. Furthermore it is shown, that in the case of an adsorption on graphite the amounts of the first, second and third term of the energy of dispersion powers and the absolute amount of the push-off energy were 90-95, or 5-10, or 0.5 - 1, or 35 - 40 % respectively of the total energy of dispersion powers in the investigated

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Adsorption Equilibria and the Energy of Adsorption Powers 62-11-4/29

adsorbed substances (adsorbates?) In the adsorption on MgO the amounts of the first, second and third term of the energy of dispersion powers, of the energy of induction powers and the absolute amount of push-off energy were about 81-83, or 12-14, or 3, or 2, or 42-48 % respectively of the total energy of the attractive powers (the dispersion and induction powers). There are 4 figures, 3 tables, and 41 references, 15 of which are Slavic.

ASSOCIATION: Institute of Physical Chemistry of the AS USSR and Laboratory of Adsorption at the Moscow State University imeni M. V. Lomonosova (Institut fizicheskoy khimii Akademii nauk SSSR i Laboratoriya adsorbtsii Moskovskogo Gosudarstvennogo universiteta im. M. V. Lomonosova).

SUBMITTED: September 3, 1957

AVAILABLE: Library of Congress

Card 3/3

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Institut fizicheskoy khimii akademii
nauk SSSR. Predstavlen.
akademikom M. M. Dubininym

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

69-20-3-7/24

AUTHORS: Avgul', N.N.; Berezin, G.I., Kiselev, A.V.; Korolev, A.Ya.

TITLE: The Heat of Adsorption of Hydrocarbons on Carbon Blacks of Different Degrees of Graphitization (Teplota adsorbtsii uglevodorodov na sazhakh s razlichnoy stepen'yu grafitirovaniya)

PERIODICAL: Kolloidnyy zhurnal, 1958, vol XX, Nr 3, pp 298-304 (USSR)

ABSTRACT: In the article the adsorption isotherms and the differential heats of adsorption of 3-methylhexan and benzene on the black sferon-6, graphitized at 2,800°C, were studied. In Graph 1, the absolute adsorption isotherms of the two vapors on black sferon-6 heated to 1,700 and 2,800°C are represented. Both coincide, i.e. the temperature has no influence on the adsorption properties of blacks. The heats of adsorption of hydrocarbons on carbon black graphitized at 2,800°C are close to the theoretical values for the potential of adsorption forces calculated previously.
There are 4 graphs, 3 tables, and 17 references, 13 of which are Soviet and 4 English.

Card 1/2

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69-20-3-7/24

The Heat of Adsorption of Hydrocarbons on Carbon Blacks of Different Degrees of Graphitization

ASSOCIATION: Institut fizicheskoy khimii AN SSSR (Institute of Physical Chemistry of the USSR Academy of Sciences). Laboratoriya sorbtsionnykh protsessov (Laboratory of Sorption Processes)

SUBMITTED: March 15, 1958

Card 2/2 **1. Hydrocarbons—Heat of absorption 2. Carbon black—Applications**

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

5 (4)

AUTHORS: Avgul', N. N., Berezin, G. I., Kiselev, A. V., Lygina, I. A.

SOV/62-59-5-5/40

TITLE: Adsorption Heat of a Number of Isoalkanes, Naphthenes and of Toluene on Graphitized Carbon Black (Teplota adsorptsii ryada izoalkanov, naftenov i toluola na grafitirovannoy sazhe)

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 5, pp 787 - 796 (USSR)

ABSTRACT: In this work the following hydrocarbons were investigated as to their adsorption heat: three isoalkanes (neohexane, isoheptane, and isooctane), two alicyclic hydrocarbons; cyclopentane and methylcyclopentane, and the alkylaromatic compound toluene. The hydrocarbons had been selected in this way in order to investigate the effect of the chain branching, the ring formation of these chains, and the introduction of aliphatic substituents into the naphthene and benzene ring on adsorption. The hydrocarbons used in the investigations had been synthetized at the Institut organicheskoy khimii AN SSSR (Institute of Organic Chemistry of the AS, USSR) by Ye. A. Mikhaylova, A. F. Plate, A. I. Liberman, and S. V. Zotova. The authors express their gratitude for their help. The constants of these substances are summariz-

Card 1/3

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

Adsorption Heat of a Number of Isoalkanes, Naphthenes and of Toluene on Graphitized Carbon Black SOV/62-59-5-5/40

ed in table 1. "Sferon"-6 was used as adsorbent; it was graphitized at 1700°. The differential adsorption heat was determined at 20° in a calorimeter with constant heat exchange; the amount of the adsorption was determined by means of a capillary vacuum liquid microburet. Figures 1, 2 show the isothermal lines of adsorption of the various substances and figures 3, 4 show the dependence of the differential adsorption heat on the amount of heat adsorbed by the individual substances. The figures show that the normal adsorption heat of isoalkanes and naphthenes is lower than that of the corresponding n-alkanes. The value of the adsorption heat of cyclopentane amounts to only half of that of n-pentane. Cyclopentane, therefore, shows greater attraction towards the adsorption layer, its isothermal line of adsorption is concave at its beginning. It can be seen from the thermodynamic evaluation of the experimental data obtained that the isothermal line of adsorption of cyclopentane cannot be represented by the Langmuir equation or BET equation but by an equation which allows for the interaction adsorbate-adsorbate

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

Adsorption Heat of a Number of Isoalkanes, Naphthenes and of Toluene on Graphitized Carbon Black SOV/62-59-5-5/40

(Fig 5). The entropy curves (Fig 6) indicate that the state of isoalkanes and naphthenes in the dense adsorption layer on graphite is much closer to the liquid state than that of n-alkanes. The methyl group in the toluene molecule reduces its mobility with respect to the unsubstituted benzene and the other purely cyclic compounds. With regard to the theoretical calculation of adsorption heat it was assumed that, in the case of the ramified hydrocarbons, the adsorption heat is an additive function of the number of carbon atoms in the molecule. The free adsorption energy and the surface of the adsorbent occupied by molecules were determined according to the same assumption. There are 6 figures, 3 tables, and 17 references, 12 of which are Soviet.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry of the Academy of Sciences, USSR)

SUBMITTED: July 25, 1957

Card 3/3

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102610015-5

5 (2), 5 (4)

AUTHORS: Avgul' N. N., Kiselev, A. V., Lygina, I. A., Poshkus, D. P.

SOV/62-59-7-7/38

TITLE: A Contribution to the Calculation of the Energy of the Adsorption of Nonpolar Molecules on Graphite (K raschetu energii adsorbtsii nepolyarnykh molekul na grafite)

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 7, pp 1196-1206 (USSR)

ABSTRACT: In this paper the details of a calculation of the adsorption energies of simple and compound molecules carried out in a previous paper are represented. The calculations were carried out according to the formulas from paper reference 1 according to which the adsorption energy is determined by the expressions

$$\Phi_i' = - C_{i1}\sum_j r_{ij}^{-6} - C_{i2}\sum_j r_{ij}^{-8} - C_{i3}\sum_j r_{ij}^{-10} + B_i'\sum_j e^{-r_{ij}/\rho}$$

$$\Phi_i'' = - C_{i1}\sum_j r_{ij}^{-6} - C_{i2}\sum_j r_{ij}^{-8} - C_{i3}\sum_j r_{ij}^{-10} + B_i''\sum_j r_{ij}^{-12}$$

r_{ij} is the distance of the center of the i-th adsorption molecule from the center of the j-th atom of the adsorbent.

Card 1/4

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$C_{i1,2,3}$ are constants of the dispersion reaction, B' and B" are the constant of the exponential function and the constant of the repulsion preceding the powers. φ is an exponential constant of the repulsion. The calculation is carried out in two parts, the geometric one in which the distances of the adsorbed link i to all atoms j of the lattice of the adsorbent are calculated for different distances of the former from the surface. For this calculation only the lattice constants of the adsorbent have to be known. For the second part of the calculation of the forces the constants charaterizing the reactions of both substances have to be determined. The calculation of the sums of r_{ij} was carried out for n = 6, 8, 10 and 12 for the different distances of the adsorbed link from the basis of the adsorbent equal to 2, 2.5, 3, 3.5 a (a is the distance of the nearest atom). In table 1 the results of the calculation of the sums $\sum^{r_i} r_{ij}^{-n}$ are combined. The distances of the remaining graphite volume were determined from the integrals (3), (4), (5) (Table 2).

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The sums $\sum^{r_i} r_{ij}^{-n} + \int_{(n)}$ are represented in tables 4 and 5 and the graphic representation in figure 2. The value $\sum e^{-r_{ij}/0.28}$ for ϱ in table 6 was equated to 0.28 according to reference 6. For the sums of tables 4, 5 a simplified form with the constants p_n and q_n, the values of which are given in table 7, is introduced and the functions (1) and (2) are represented in the variable z

(6), (7). $\left(\sum^{r_i} r_{ij}^{-n} + \int_n = p_n z^{-q_n}\right)$. Next, the calculation of the reaction constant $C_{i1,2,3}$ is carried out. The values for different adsorptives are given in table 7 with the constants α and χ (polarizability, magnetic susceptibility) being necessary for the calculation of $C_{i1,2,3}$. ϕ' and ϕ'' were then determined by the aid of computed constants. The results for ϕ''

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A Contribution to the Calculation of the Energy of the Adsorption of Nonpolar Molecules on Graphite SOV/62-59-7-7/38

are given in tables 10 and 11. The calculation of the attraction- and repulsion constants was carried out from the balance energy of the adsorption of compound molecules on the basis of an additive scheme. There are 6 figures, 11 tables, and 8 references, 2 of which are Soviet.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry of the Academy of Sciences, USSR) Khimicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta im. M. V. Lomonosova (Chemical Department of the Moscow State University imeni M. V. Lomonosov)

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AVGUL', N.N.; BEREZIN, G.I.; KISELEV, A.V.; LYGINA, I.A.

Adsorption and the heat of adsorption of n-pentane and n-hexane on barium sulfate. Izv. AN SSSR.Otd. khim. nauk no.11:1948-1954 N '60. (MIRA 13:11)

1. Institut fizicheskoy khimii AN SSSR.
(Heat of adsorption) (Pentane) (Hexane) (Barium sulfate)

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AVGUL', N.N.; BEREZIN, G.I.; KISELEV, A.V.; LYGINA, I.A.

Adsorption and heat of adsorption of normal alcohols on graphitized carbon black. Izv. AN SSSR. Otd. khim. nauk no.2:205-214 F '61. (MIRA 14:2)

1. Institut fizicheskoy khimii AN SSSR.
(Adsorption) (Carbon black) (Alcohols)

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AVGUL', N.N.; KISELEV, A.V.; LYGINA, I.A.

Adsorption energy of CO_2, SO_2, $(CH_3)_2CO$ and $(C_2H_5)_2O$ on graphite. Izv. AN SSSR. Otd.khim.nauk no.8:1395-1403 Ag '61. (MIRA 14:8)

1. Institut fizicheskoy khimii AN SSSR.
(Adsorption)

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AVGUL', N.N.; KISELEV, A.V.; LYGINA, I.A.

Adsorption energy of water, alcohols, ammonia, and methylamine on graphite. Izv. AN SSSR. Otd.khim.nauk no.8:1404-1411 Ag '61. (MIRA 14:8)

1. Institut fizicheskoy khimii AN SSSR.
(Adsorption)

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AVGUI', N.N.; KISELEV, A.V.; LYGINA, I.A.

Adsorption and heat of adsorption of diethyl ether, acetone, and acetic acid vapors on graphitized carbon black. Izv. AN SSSR Otd.khim.nauk no.12:2116-2125 D '61. (MIRA 14:11)

1. Institut fizicheskoy khimii AN SSSR.
(Adsorption) (Ethers) (Acetone) (Acetic acid)

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AVGUL', N.N.; KISELEV, A.V.; LYGINA, I.A.

Isotherms and heats of adsorption of alcohols on carbon blacks of various degrees of graphitization [with summary in English]. Koll.zhur. 23 no.4:369-375 Jl-Ag '61. (MIRA 14:8)

1. Institut fizicheskoy khimii AN SSSR, Gruppa khimii poverkhnosti, Moskva.
(Alcohols) (Heat of adsorption)

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AVGUL', N.N.; KISELEV, A.V.; LYGINA, I.A.

Adsorption and heat of adsorption of isomeric butanols on graphitized carbon black. Koll.zhur. 23 no.5:513-520 S-O '61. (MIRA 14:9)

1. Institut fizicheskoy khimii AN SSSR, Gruppa khimii poverkhnosti, Moskva.
(Butyl alcohol) (Heat of adsorption)

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AVGUL', N.N.; KISELEV, A.V.; LYGINA, I.A.

Adsorption and the heat of adsorption of pyridine and benzene vapors on graphitized carbon black. Izv. AN SSSR Otd.khim.nauk no.1:32-37 Ja '62. (MIRA 15:1)

1. Institut fizicheskoy khimii AN SSSR.
(Pyridine) (Benzene) (Heat of adsorption)

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AVGUL', N.N.; KISELEV, A.V.; LYGINA, I.A.

Potential energy of adsorption of sphere-shaped molecules of Ch_4, $C(CH_3)_4$, and CCl_4 on graphite. Izv.AN SSSR.Otd.khim.nauk no.8:1346-1353 Ag '62. (MIRA 15:8)

1. Institut fizicheskoy khimii AN SSSR.
(Adsorption) (Molecules)

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